(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 822 381 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
19.08.1998 Bulletin 1998/34

(51) Int Cl.⁶: **F28D 1/03**, F28F 9/18

(43) Date of publication A2:
04.02.1998 Bulletin 1998/06

(21) Application number: **97305236.8**

(22) Date of filing: **15.07.1997**

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV RO SI

(30) Priority: **31.07.1996 JP 217983/96**

(71) Applicant: **Sanden Corporation**
Isesaki-shi, Gunma 372-8502 (JP)

(72) Inventor: **Shinmura, Toshiharu**
Isesaki-shi, Gunma 372 (JP)

(74) Representative: **Jackson, Peter Arthur**
GILL JENNINGS & EVERY
Broadgate House
7 Eldon Street
London EC2M 7LH (GB)

(54) Heat exchanger

(57) A heat exchanger (10) comprises at least one conduit (16,17) which has a plurality of slots (16C,17C) therein. A plurality of tube units (12,22) each has at least one open end (12A,22A) thereof. The open end (12A, 22A) of each the tube units (12,22) is fixedly and hermetically coupled to the slots (16C,17C) of at least one conduit (16,17). The tube units (12,22) in fluid communication with the interior of the conduit (16,17) through the open end (12A,22A) of each tube unit (12,22). A limiting mechanism (126,226) is provided adjacent to the open end (12A,22A) of the tube units (12,22) for limiting the conduit (16,17) to have a predetermined position without inclining related to the tube units (12,22).

Thereby, the heat exchanger (10) could be temporally assembled without any relative sliding motion between the plurality of tubes and tanks while simultaneously non-decreasing the efficiency of manufacturing costs of the heat exchanger.

FIG.7